DOCUMENT RESUME

ED 089 743 IR 000 455

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TITLE Scientific and Technical Information Services in Indonesia; An Approach to Development in 1974-79 Under the Second Five-Year Plan.
INSTITUTION National Scientific Documentation Center, Djakarta (Indonesia).
PUB DATE Aug 72
NOTE 38p.

EDRS PRICE MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS Agriculture; Biological Sciences; *Developing Nations; Humanities; *Information Centers; *Information Needs; *Information Networks; Information Scientists; *Information Services; Information Sources; Information Utilization; Libraries; Library Education; Medicine; National Libraries; Physical Sciences; Problems; Sciences; Social Sciences; Technology
IDENTIFIERS *Indonesia; Scientific and Technical Information

ABSTRACT

A wide range of recommendations for developing an effective network of scientific and technical information services in the Second Five-Year Plan of Indonesia are outlined here. The document indicates the importance of scientific and technical information in developing countries and proposes an approach to the problems of policy, finance, and administrative control for information services. Also considered are the functions of national centers and specialized units in the fields of the physical sciences and agriculture, medicine, and the social sciences. (CH)

ED 089743

SCIENTIFIC AND TECHNICAL INFORMATION SERVICES IN INDONESIA

An approach to Development in 1974-79 under the Second Five-Year Plan

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London, August 1972

IR 000 455

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LETTER OF TRANSMISSION

To Professor Sarwono Prawirchardjo
Chairman, Indonesian Institute of Sciences (LIPI)
Djalan Tenku Tjhih Ditiro 43
Jakarta
Indonesia

Dear Professor Sarwono

I have the honour to submit to you the report on my visit to Indonesia in August 1972. May I take this opportunity of thanking the British Council for inviting me to undertake this task, which I have found both stimulating and challenging, and also of thanking you for your personal interest in the visit and for the ready help and facilities that I was offered by LIPI.

Between 31 July and 19 August I spent 18 working days in Jakarta, Bogor and Bandung, meeting a wide variety of administrators, scientists and information specialists, both individually and in small groups. The purpose of the visit, as recorded by the British Council, was "to assist the Director of the Indonesian National Documentation Centre in drawing up a detailed plan for submission to the National Planning Authority for a system of scientific and technical information, to be implemented in the Second Five-Year Plan beginning April, 1974".

Much of the advice that I have given has been oral, some of it informal. The attached report, however, contains all that is formal and significant. The advice covers a wide range of subjects and problems and omits only two important aspects:

1. Financial details. These depend on a careful assessment of staffing requirements and salaries and call for a close understanding of local conditions. I have, however, discussed with the Director of PDIN various alternative ways of making the calculations and presenting the estimates.

2. Internal administration of national information centres. This task has been attempted by a previous consultant (Bryan 1972) and I have nothing to add to what is said in his most valuable report.

Although the main purpose of the visit was to help one national centre, I was asked to visit the comparable centre in agriculture and to take into account both its needs and problems and those of the centres envisaged for medicine and for the social sciences and humanities. I was also asked to consider the functional relations between the national centres and the smaller specialist units in research and development institutes that are to form an essential part of the national information network.

I should like to make it clear that the views expressed in this report are my own and not those of either my employer, the UK Department of Education and Science, or the British Council.

Finally it gives me very great pleasure to thank the Director of PDIN and her colleagues who supplied me with all the background information that I requested, accompanied me at all the interviews and responded quickly and with interest to the various ideas that I explored with them; and to thank also the staff of the British Council in Indonesia, in particular the librarians in Jakarta and Bandung, who worked closely with PDIN and other Indonesian organisations in order to make my short stay as fruitful as possible.

1. THE IMPORTANCE OF SCIENTIFIC AND TECHNICAL INFORMATION

1. During the last ten years the importance of information to scientists and technologists has been increasingly recognised by all developed and many developing countries. It is widely considered to be an essential resource, as vital to economic growth as resources of capital, skill and enterprise. While many problems of scientific and technical information are international in character, the first requirement is that each country should build up an effective network of information services and should create a national co-ordinating focus which, more than any other body, is concerned with the development of national information policy. This principle has been recognised by member countries of the Organisation for Economic Co-operation and Development in setting up a Scientific and Technical Information Policy Group and by members of the Council for Mutual Economic Assistance in deciding to co-operate on a CMEA scientific and technical information system which will be founded on the national systems of each member country. Above all the principle has been acknowledged by members of UNESCO in approving* a major expenditure of science and UNDP funds on the UNISIST programme, which contains recommendations on the building up of existing information services (Recommendations 7-10), on national foci (Recommendation 15) and on special implications for the internal policies of developing countries (Recommendation 20). This last recommendation is reproduced below.

> "RECOMMENDATION 20 - The existence of a qualified and adequately funded national structure for scientific research and development should be acknowledged as a prerequisite for the evolution of an effective scientific library and documentation network in any country. Subject to this condition, developing countries should consider the following actions as instrumental to the purposes of UNISIST: (i) the establishment of a central scientific and technical information agency, responsible for planning and co-ordinating the information resources; (ii) the establishment of co-operative agreements with other countries; (iii) promotion of the adoption of standards, methods, and procedures that might facilitate the integration of information services into a world-wide network."

2. It is important to note that the initiative behind UNISIST lies not with information specialists,** but initially with the community of scientists through its International Council of Scientific Unions and subsequently with governments through UNESCO. At the UNISIST Conference in October, 1972, it was made clear that the World Federation of Engineering Organisations also wanted to take an active part in the work. In most developed countries it is naturally assumed that the creation of effective information services requires close co-operation between the users - whether research workers, practitioners or administrators - the information specialists and the Government, as a principal source of funds for research, development and innovation.

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* Final approval by the General Conference is expected in October 1972.

** A general term, used throughout this report to cover librarians, documentalists and those who extract and re-present information from the literature.

3. While information is equally important to workers in pure science, applied science, development and operation, in developing countries it is mainly justified in relation to the last three groups. What matters is its contribution to economic growth and to physical and social wellbeing. It is imprudent, in a highly competitive world, to set about modernising old industries and creating new ones without knowing how new research is affecting the processes, techniques and materials involved. Failure to apply this knowledge can soon lead to defeat by better-informed competitors. Equally it is unwise for a developing country to devote its very scarce resources to new research without first examining the literature for work already done and then keeping up-to-date on current work as the results are published. Studies made in developed countries show clearly that the penalties of not doing so include needless duplication of effort and failure to avoid blind alleys or to take the shortest cuts.

4. The evidence strongly suggests that many developing countries are taking seriously the need to improve their access to scientific and technical information and see UNISIST as a useful framework for the stimulation of international co-operation and for the channelling of UNDP funds to support national initiatives. A country that fails to do this risks not only widening the gap between itself and developed countries but also falling behind other developing countries.

2. THE ESSENTIAL REQUIREMENTS OF INDONESIA

5. Scientific and technical information received a brief but helpful mention in Chapter 16 of the First Five-Year Plan, and the modest funds devoted to it have permitted a start on the build-up of libraries and services. In general progress has been greatest where funds, from national sources or from technical assistance, have been most plentiful - though, of course, they need to be deployed with skill. But in most subject fields resources have been far from sufficient and progress has been slow and halting. The total resources of scientific and technical literature are still far too small to provide services of reasonable quality to many and varied users. Funds for acquiring new literature are inadequate - in some institutes pitifully small; too often they are not supplied on a regular basis. Arrangements for the deposit of Indonesian material are nowhere near as systematic as they should be. The low status and salaries of information specialists make it difficult to attract recruits of sufficient calibre, the only available course of postgraduate education concentrates on librarianship only, and, until more good information units have been built up, there is little scope for recruits to gain local practical experience in a variety of work and in a stimulating environment. Above all in most subject fields the level of use of services is still low and the problem of promoting greater use is complex and serious.

6. In recent years several consultants have drawn attention to some or all of these weaknesses - Shank (1970) and Bryan (1972) dealing broadly with the subject, Williamson (1970) with university libraries, and Urata (1971) with medical libraries. In my talks with various administrators, including heads of information units, I have sensed an almost universal concern that the weaknesses require serious attention now. The time seems right in all respects, therefore, for seeking high priority for scientific and technical information services in the Second Five-Year Plan. I recognise that Indonesia, despite the economic growth of recent years, still has very limited resources for development and very many calls on these resources. But information is so central, and crucial, to so many sectional plans that it would be a false economy to let it continue to grow in 1974-79 at the uneven and largely ineffectual pace of 1969-74.

> RECOMMENDATION 1. The Government should state in the Second Five-Year Plan its intention, as a matter of priority, to develop an effective network of scientific and technical information services as quickly as resources will allow; to back this intention with a significant increase in the funds available for acquiring literature, educating and training skills, and providing information services; and to ensure that these funds are well directed and spent by setting up inter-departmental machinery to determine and review the goals of the national network, to co-ordinate the functions of the various centres and units in the network, and to examine obstacles to effective development of services with a view to removing them wherever possible.

7. This is a central recommendation, couched in general terms and capable of being adopted in a variety of ways. The remainder of this report indicates my own approach to the problems of policy, finance and administrative control that it raises.

2. A FRAMEWORK FOR PLANNING

8. Following a Workshop of Scientists and Information Specialists in June 1971, thinking among Indonesian research and development institutes has come to favour a network of libraries and information services. This network, it is envisaged, should comprise 4 national centres (covering respectively the physical sciences and technology, the biological sciences and agriculture, medicine, and the social sciences); and a much larger number of specialised units based on research and development institutes, and co-ordinated by the centres. There seems to be general acceptance of the functions proposed by Bryan (1972) for the national centres; these are reproduced as Appendix 1. Priority is being given to the first 2 fields, which are briefly reviewed below.

9. In the biological sciences and agriculture the Bibliotheca Bogoriensis (BB) has been performing many of the proposed functions for some time and has agreed a division of functions with each of the specialised units at Bogor. In the physical sciences and technology the National Scientific Documentation Centre (PDIN), which forms part of the Indonesian Institute of Sciences (LIPI), also performs many of the proposed functions and in recent years has been building up close working relations with the specialised units, both in LIPI and in the ministries. At a seminar of information specialists in June 1972, a list of desirable duties for each unit was agreed (see Appendix II), and PDIN has formally invited each research institute to nominate its information service as a unit in a more formalised network. At the time of writing several institutes have given their assent and none has responded negatively. It would appear that most, if not all, of these institutes will be making some provision for the improvement of the units in their proposals for the Second Five-Year Plan.

10. In a country so short of literature and professional skill as Indonesia, such decentralised networks are not a very efficient way of deploying resources. The number of possible units is too large (though happily reduced by the recent merging of the LIPI institutes in Bandung) and some of them are too small to cover their own subject fields well at their own expense. Their needs for literature overlap a great deal and duplication of holdings can only be kept small by having a strong and valued library at the national centre and a quick, reliable procedure for inter-library loans and photocopying. Also the country does not possess sufficient resources of manpower to provide a head for each unit who has the right combination of ability, training and experience. These problems cannot be avoided so long as research itself is organised in small units, but they can be minimised by co-operation between the ministries and institutes, including LIPI.

11. Co-operation at the professional level is already well established, notably in seminars of the kind held in June, 1 1972. But under the Second Five-Year Plan there is a strong case for setting up an interdepartmental council at a higher administrative level to co-ordinate and harmonise the activities of each organisation concerned. This idea has been under discussion for some years; it was developed by Bryan (1972) with particular reference to proposals concerning national centres; and more recently it has been developed further by a Standing Committee, headed by a deputy chairman of LIPI, which was set up by the Workshop mentioned in para 8. But now that each organisation is preparing its own submission for the Second Five-Year Plan, the need for action is becoming urgent.

RECOMMENDATION 2. LIPI should invite suitably high-level representatives of interested ministries (research directors or above) to review in outline the plans of the respective national centres and specialised units for the development of scientific and technical information services under the Second Five-Year Plan; and to secure the best possible balance, harmony and cohesion between them before they are submitted to BAPPENAS. The meeting should represent the Ministries of Agriculture, Industry, Mining and Public Works and Electrical Power on behalf of their research institutes; the Ministry of Health in relation to the proposed national centre for medicine; the Ministry of Education and Culture in relation to libraries generally, university interests and the proposed national centre for social sciences information; and finally the National Institute of Public Administration.

RECOMMENDATION 3. The representative body should also prepare, for the approval of the respective ministries and institutes, proposals for a permanent Information Council charged with the administrative functions broadly described in Recommendation 1. The Council should be created as soon as possible and should undertake, among its first tasks, those proposed in Recommendations 7, 8, 9, 10 and 12 of this report or referred to it under Recommendations 4, 11 and 23. The Council should represent the same ministries and institutes, at a suitably high level, as are listed in Recommendation 2 and also, if possible, BAPPENAS. It should be regarded as the national focus for information policy in Indonesia and should report to the Government through LIPI, which should provide the Secretariat.

RECOMMENDATION 4. PDIN should continue to convene seminars of national centres and specialised units, as required, in order to discuss operational matters and to identify major policy issues for consideration by the Council proposed in Recommendation 3. It should provide for the cost of the seminars it runs, 1-2 a year, in its financial estimates under the Second Five-Year Plan.

4. BASIC PROBLEMS TO BE SOLVED

12. Before considering the roles of national centres and specialised units in detail, it is important to analyse the 3 basic problems that face Indonesia in the development of information services for science and technology - the shortage of literature in the libraries, the supply of competent information specialists and the stimulation of effective use of information services both by research workers and by practitioners and administrators in industry and in public service. These are interrelated problems, the solution

of each depending to a large extent on the solution of the other two. It is important, therefore, that under the Second Five-Year Plan they should be tackled together in a balanced way and that each of them should have sufficient resources to keep progress in balance.

a. Resources of Literature

13. Recent work on a union catalogue of periodicals suggests that there are about 5,000 current scientific and technical periodicals in Indonesia. But nearly half of these are in biology and agriculture. A preliminary examination suggests that the total of 5,000 includes a large number of journals that are of minor importance (and mostly received through donations and exchanges) but excludes many that are widely regarded as "core" journals - ie those, of central importance, that are heavily used by scientists. The total of world periodicals in science and technology exceeds 30,000: it is not necessary, of course, for Indonesia to have more than a fraction of these, but the fraction should include all core journals, a good selection of journals from developing countries with similar problems of economic development, and an equally good selection of journals in the basic disciplines of science and in applied fields of particular concern to the Indonesian economy. (These fields I understand to be agriculture, forestry, mining and metallurgy, petroleum, pharmaceuticals and other export industries, including traditional handcrafts. I assume that medicine is a field of equal importance.) It is also necessary to make good some of the serious gaps in the holdings of periodical literature issued in the mid-1960s.

14. The same need exists for more satisfactory holdings of monographs, and other occasional literature. However, a special problem exists here in the acquisition of Indonesian publications and unpublished material, especially reports. The law at present does not require the deposit of all new publications in a national centre, and in the past there has been no provision by ministries and institutes for the deposit of their unpublished material. Bryan (1972) drew attention to both these gaps and recommended action to fill them. However, the Ministry of Agriculture had previously decreed that all its material should be deposited at BB and I understand that other ministries are considering taking similar action. I also understand that the possibility of legislation for compulsory deposit of all publications has been under consideration. Both lines of action are important for the successful development of information services under the Second Five-Year Plan.

15. Finally, there are gaps in the provision of technical reviews, digests, manuals and trade literature, which are essential to practitioners in industry and elsewhere. It is

important to fill as many of these gaps as possible, but identifying the sources and obtaining much of the literature can be a complicated and time-consuming task.

16. PDIN, in its submission for UNDP support in building up the proposed network, has suggested that a local task force should assess in detail the inadequacy of national holdings of literature and that UNDP should finance 2 consultants, at the end of 1972, to survey the material and manpower needs of PDIN and BB and to assess the need for future international assistance and likely sources of assistance. It has become increasingly clear, before and during my visit, that both consultants will need to concentrate much of their effort on helping the local task force to identify the serious gaps in all types of literature and to suggest how best they can be filled. This part of the consultancy seems to be more important at present than assessment of needs for equipment. There are other possible tasks for the consultant at BB, but these are considered in para 50.

RECOMMENDATION 5. The final version of the PDIN submission to UNESCO for support from UNDP funds should suggest that the 2 consultancies on material and manpower needs should concentrate on needs for scientific and technical literature of all kinds and should help the proposed local task force to identify more precisely the items to which it should give priority and to indicate the scale of growth in the total holdings that is necessary under the Second Five-Year Plan.

RECOMMENDATION 6. Seminars of information specialists, convened by PDIN and BB, should then ensure that each national centre and specialised unit works out detailed proposals for the acquisition of literature in 1974-79 and includes these proposals in its request for funds under the Second Five-Year Plan. The seminar members should assume that the maximum benefit for Indonesian science and technology will be obtained if the growth of literature resources is most rapid in the first 2 years of the Plan, so that greatly increased resources are available for exploitation and use at an early date.

RECOMMENDATION 7. The proposed Information Council should seek to ensure that each member department and institute makes effective arrangements for the deposit of its reports and other unpublished literature. The receiving library can be in either one of the specialised units or in a national centre.

RECOMMENDATION 8. The Information Council should also consider at an early date the case for legislation requiring deposit of all Indonesian publications in national centres, and, if there are no serious obstacles, should press for early legislation.

b. Supply of Information Specialists

17. This serious problem falls into 3 parts - the supply of suitable recruits, their basic education in information work and the provision of facilities for practical training and experience.

18. THE SUPPLY OF SUITABLE RECRUITS is seriously hampered by the poor salaries, status and image of professional work in this field. Salaries are considerably lower than those of scientists and administrators, except for staff who possess master's degrees. I understand that salaries for Government information specialists are likely to increase in real terms during the period of the Second Five-Year Plan; but there is an urgent need for increase now if able men and women are to enter and qualify themselves for this work. Equally the status of information specialists is often low. They may have inadequate and unsuitably placed accommodation, outdated and inconvenient equipment, little priority in bids for available funds and little or no access to the councils where policy is made. I have seen important exceptions to this general description, which should act as guides to other institutes in shaping their future policy. I have also seen institutes where a change of policy is already taking place under energetic leadership from the director. The need, therefore, is to speed up this change and ensure that it is initiated in the institutes that so far lag behind.

19. Two important developments are worth noting and taking further. First, the term "information" is being more widely used in the names of organisations of divisions and in papers on the subject. Previously the terms "library" and "documentation" have predominated in Indonesia and, while these are wholly respectable terms describing wholly respectable functions, they denote in many minds the static functions of collection, storage and recording. The word "information" more emphatically implies service to the user and is more attractive to scientists and possible to some recruits. There is a good case for extending its use. I should perhaps note that all the international organisations and virtually all the national organisations referred to in para 1 already prefer it.

20. Secondly, several research institutes have recently nominated one of their scientists to head their information units and are seeking to have them trained for the work. This is a very desirable move if, as in these cases, the chosen officers are able, interested in the work and happy to make the transfer. The practice is worth extending, though it does present problems of education and training, which are dealt with in paras 22 onwards. Another possibility, already tried out by PDIN, is to employ scientists temporarily or permanently on tasks which they can perform with only a small amount of training - for example selective dissemination

of information to individuals or groups, retrospective searches of the literature and compilation of special bibliographies. In a few research institutes "bench" scientists contribute abstracts, digests and answers to questions that cannot be handled by reference to the literature; by doing so they give a positive service to other research workers and to practitioners in industry and elsewhere. This involvement of scientists increases their interest in information problems and is worth extending for that reason alone. But it would be prudent to explore as well the possibility of employing scientists whole-time on work of this kind at least for limited periods, and to study the experience of institutes in developed countries that have taken this step.

RECOMMENDATION 9. The proposed Information Council should, as a matter of urgency, review the twin problems of low salaries and status of information specialists in Government service, explore possible ways of raising the salaries of all graduates to a level approaching that of research workers, and consider how best the process of raising the status of information specialists can be speeded up. It should pay particular attention to the need for information specialists to work in scientific, not administrative divisions and to receive regular allocations of funds so that they can plan ahead and develop managerial skill.

21. This recommendation develops further a recommendation by Bryan, 1972.

RECOMMENDATION 10. The Information Council should also promote the use of the term "information", wherever appropriate, in the titles of national centres and units that offer a range of information services, and also in official papers on the subject.

RECOMMENDATION 11. LIPI should convene in 1973 a second workshop of research directors and information specialists to consider how far the practice of nominating good and keen scientists to direct information units, after training, can be extended; to further the growing practice of grouping all information activities, including publications, in one unit; and to explore the possible scope for using scientists, part-time or whole time, temporarily or permanently, on information functions, both scientific and technical, which they can perform with little or no training. The workshop should make recommendations for research directors and heads of information units and should refer major policy issues, as necessary to the proposed Information Council.

22. BASIC EDUCATION IN INFORMATION WORK presents serious problems for the national centres and specialised units. The two-year postgraduate course at Indonesia University leads to a master's degree but is confined to librarianship and is

situated in the Faculty of Letters. The first graduates to complete the course, as distinct from graduates of an earlier first-degree course, will not be available for employment at least until the end of this year, though I understand that some of them are receiving a limited amount of practical experience as part of the course. Disciplined education in information work (sometimes called "information science") has to be obtained abroad, and both US and European courses have been used. The scope for such education has been severely restricted by shortage of funds, though assistance has been received from several external agencies and will now be available from UNDP funds on behalf of UNISIST. With the nomination of scientists in research institutes for senior posts in information units, the queue of good people for overseas courses is likely to lengthen and the need for action is urgent. PDIN is having one officer educated in the USA on AID funds and another in the UK on Colombo Plan funds. It is seeking further support for such education in 1973/74. BB and the units also wish to seek foreign assistance for this purpose and, as the Second Five-Year Plan comes into operation, there will be an increasing need to co-ordinate the individual approaches to external agencies and possibly to establish some method of allocating priorities.

23. It is even more important to build up suitable educational facilities in Indonesia itself and so eventually reduce the need to go overseas. The ideal solution would be a newly designed course covering all aspects of information work, because experience suggests that it is difficult to build up the right kind of course as an extension to a traditional and narrowly conceived course in librarianship. But I am assured that there are not yet sufficient potential teachers to staff a second course, and I am also encouraged by the desire of the library school's director to meet the new requirements of national centres and units. It is easy to outline subjects which might be included in an extended curriculum - documentation, the nature of scientific communication, techniques of information handling (including a brief introduction to computer techniques), sources of information, and technical writing, editing and presentation. But it is much more difficult to suggest how these topics can be combined in one course and to decide whether the course should remain an integrated one or whether it should comprise a core section and various options which can be grouped in different ways.

24. To deal with this task a working party is needed which can analyse the growing requirements of information specialists and give constructive advice to the director of the library school. But the working party itself will need external assistance from someone who has experience of teaching in information science; and later the library school will need assistance in designing, running and testing the extended course and in training Indonesian staff to run it after his return. PDIN is seeking UNDP funds for 2 consultants, based on PDIN and BB respectively, to provide training to Indonesian

documentalists over a period of 3 months. It would be valuable if one of these consultancies (PDIN's) could be extended to permit the 2 successive functions described above.

25. A further need is to give the library school a broader basis of support within the university, that is to gain support from the social science, science and medical faculties as well as the Faculty of Letters. There is also a twin need to introduce the library assistants' course that is being planned at the library school and to co-ordinate the various courses for library assistants in Indonesian institutions in order to ensure more even standards and a common, widely acceptable qualification.

26. Finally short in-service courses, including refresher courses, are a valuable supplement to full-time academic courses. PDIN has run 3 such courses, each of three-months' duration, and several information specialists have told me that they found them valuable. At present PDIN has discontinued the courses, largely because it lacks suitable rooms and facilities. But this should not be an insuperable obstacle. During my visit the director of a research institute in Jakarta told me that the educational facilities in its new building were available for use by other Government bodies; these facilities include residential accommodation. There are also good facilities in Bandung, where the Regional Housing Centre (LPMB) is to run a 2 weeks' course in October 1972, followed by practical training in Jakarta at the Library of the Ministry of Public Works and Electrical Power. These various courses should continue and preferably should be planned in the light of consultation with information specialists from the national centres and units in periodical seminars. Very soon they will probably need to become more specialised, for example in indexing techniques, selective dissemination, and technical writing. Some of these courses could be run in conjunction with the extended library school.

RECOMMENDATION 12. The proposed Information Council, with help from a seminar of information specialists from the national centres and units, should co-ordinate the individual approaches to external aid agencies for support of Indonesian graduates on postgraduate course abroad; and, if possible, should try to allocate priorities on the basis of need.

RECOMMENDATION 13. LIPI should invite the University of Indonesia (i) to set up a joint working party with PDIN to analyse the growing requirements of information specialists and to advise the director of the library school on the curriculum required; and (ii) to investigate the possibility of making the library school independent of the faculties but supported by all of them.

RECOMMENDATION 14. PDIN, in its final submission for UNDP funds, should seek to extend its three-month

consultancy on the training of documentalists so as to provide for an initial visit of 4-6 weeks in which the consultant would help the joint working party to identify the requirements of information specialists and to determine the scope, aims and general structure of the extended course; and for a subsequent, much longer visit in which the consultant would help the director of the school to design, run and test the new sections of the course, with advice from the working party, and to train Indonesian staff to run the course after his return. If UNDP cannot support the subsequent visit, funds should be sought elsewhere.

RECOMMENDATION 15. LIPI should ask the Ministry of Education and Culture whether, when the proposed course for library assistants at Indonesia University is authorised, it could take steps to ensure even standards between the various courses for library assistants in Indonesian institutions and to establish a common qualification which can be obtained on any of the courses.

RECOMMENDATION 16. PDIN should resume its three-month courses for in-service education, making use of available acommodation facilities in Jakarta, Bandung and possibly Bogor, and working in close co-operation with the heads of national centres and units. It should seek to introduce courses of a more specialised nature and, wherever possible, to encourage local initiative such as that recently shown by LPMB.

27. FACILITIES FOR PRACTICAL TRAINING AND EXPERIENCE are badly needed in Indonesia to supplement education on formal courses. But at the moment there is a vicious circle in which lack of training facilities slows the rate at which information specialists gain competence through experience, and this in turn slows the rate at which units suitable for training can be built up. There are only 2 ways of dealing with this problem; to secure training and experience abroad wherever possible; and to persuade those centres and units that can offer good training facilities to take as many trainees as they can. As more units grow in strength they can be invited to join the scheme so as to spread the undeniably heavy load.

28. Some practical training is provided on the PDIN courses and will be provided on the LPMB course mentioned above. But it is necessarily short and gives more an appreciation of the problems than a competence in dealing with them on a day-to-day basis. There is every reason to continue with such short-term training but it does need to be complemented by longer and more intensive periods of experience.

RECOMMENDATION 17. National centres and specialised units sending officers on postgraduate courses abroad

should try to extend each visit by at least 3 months in order to include practical training in a lively information centre, whether or not this is a compulsory feature of the course. PDIN should be consulted about possible locations and possible ways of making the necessary arrangements.

RECOMMENDATION 18. Centres and units should offer to take as many trainees as possible as soon as they grow to the point where they can offer instructive experience for up to 3 months in a lively environment where a variety of information work is going on. PDIN, as well as offering these facilities itself, should co-ordinate the growth of facilities and the use of them by information specialists. In particular it should seek to spread the benefits of training evenly between the various centres and units.

c. Use of Literature and Information Services

29. In a sense effective use of information is more difficult to achieve than adequate resources of literature and competent handling of them by information specialists. Even developed countries are still trying by various means to tackle better what is essentially a human problem. In Indonesia, however, the use of scientific and technical information is in most fields so small that urgent action is needed to deal with the situation.

30. To a large extent low use correlates directly with small and badly organised collections. Where a local unit holds a useful range of literature and bases a good service on it, it is rewarded by more regular and efficient use. But to an equally large extent the problem results from most Indonesian scientists being educated in an academic environment woefully short of literature. The habit of reading has not been well formed at the crucial stages in education, and like other habits it is more difficult to acquire later in life. Understandably the scientiests most interested in information problems tend to be those who have travelled widely and made firm contact with scientific work in other countries.

31. In some research institutes the problem is well understood and much has been done, or is being done, to solve it. One research director even encourages his staff to write advanced text books - a sure way of making them consult the literature! These institutes, of course, are already developing good information services. But in general the pattern of use varies greatly from one institute to another and most of them need to take a fresh look at the problem.

32. In developed countries scientists themselves have started many of the widely used information services. Though most of the work on the services is done by information specialists, scientists often retain control of policy and seek to develop the services on lines that they will find useful. It would seem advantageous to try and introduce something of this principle into Indonesian research institutes and universities. Already there is a good deal of effort to involve scientists in selecting what they want. Selection of new literature at BB is made on the advice of a library committee composed of scientists from the agricultural institutes - though they represent subject fields, not their institutes. In some of the units scientists are sent lists of publications that may be of interest and are asked to indicate their preferences. PDIN offers a current-awareness service which involves circulating to individuals or institutes the photocopied contents pages of periodicals that they wish to see and then sending photocopies of any articles requested.

33. But these initiatives require only a limited involvement of scientists in either the selection of literature or the design of services. More can be done, as the holdings of literature are increased under the Second Five-Year Plan. For example it is possible to acquaint scientists with sample copies of all core journals not yet held in Indonesia and seek their views as to which might be valuable. Experiments can be run in which selected scientists scan the leading abstracting and indexing journals for a period and judge for themselves which of the periodicals, reports series, etc not held in Indonesia seem to be potentially valuable. Surveys of use of libraries can be made, for example that recently initiated by BB, and discussion can be promoted on significant variations in the pattern of use. Similar surveys can be made of the use of bibliographic and other information services, especially those that are being tried out for the first time.

34. I produce these suggestions as examples, not as specific recommendations. They are all ways of establishing the principle that scientists will be better served with information if they try to use the services systematically, try to find out how the services and the literature coverage can be improved, and take an active part in building up services. Recent research on patterns of information flow suggests that there are in most research organisations one or more scientists, widely known as "gatekeepers", who have a natural interest in, and aptitude for, transfering information from one place, or individual, to another, It would seem valuable to identify such people wherever possible and give them responsibility for interesting their colleagues in information services, organising some sort of training in how to use them and securing a feed-back of constructive ideas for the improvement of services.

35. Experience in the UK and other countries has shown that training in the use of abstracting and indexing services is fairly simple and need not take up more than a few hours of lectures and practical work provided that the numbers on any one course are small. It should be possible to devise similar methods of training for Indonesian circumstances, drawing on PDIN and other local information services as well as the major abstracting and indexing services, and to use these methods on courses held locally in research institutes and led by local staff with the aid of a central team in PDIN. However, a consultant is needed to initiate the project by designing a course that is adaptable to local requirements, testing it out in a few locations and training PDIN staff to form a central team.

36. The foregoing paragraphs are concerned with only one kind of user - the research worker. Research institutes in the ministries concerned with industry have particular problems of stimulating, training and satisfying users in industrial firms; but in my short stay I have not had time to study this aspect of the subject in detail and am therefore in no position to make recommendations, though it does occur to me that the experience of LPMB in building up a wide range of useful services might be worth recording and disseminating to other units. However I was told that the Ministry of Industry proposes to set up an extension service in all regions of Indonesia as part of the Second Five-Year Plan, and it would be extremely valuable if PDIN could study in advance the best ways of meeting the information requirements of the extension officers when appointed.

> RECOMMENDATION 19. LIPI should invite each director of a research institute to nominate a senior scientist, preferably one who shows interest in and aptitude for information exchange, to be responsible for stimulating interest among his colleagues in use of the literature and of information services, securing training of them in the use of locally available services and encouraging them to contribute from their experience to the improvement of services provided for them.

37. It is envisaged that these tasks may take a substantial amount of the scientist's time for a short period, perhaps two months, but that the amount will then diminish until it ceases to disrupt his normal duties except when a training course is being run. It is also envisaged that the officer need not be committed indefinitely to this activity but can pass it to a suitable successor after about two years - by which time the activity can, perhaps, be concentrated on new staff.

RECOMMENDATION 20. PDIN should take responsibility for creating a central team to help other centres and units run user-training courses involving both lectures and practical work. It should give priority, in seeking further support from external funds, to obtaining a consultant who can study the present pattern of use and non-use, design a course that is adaptable to local requirements, test it in a few locations and train PDIN staff to form a central team. The visit would need to last six months, preferably a year.

RECOMMENDATION 21. PDIN with help from the units in industrial research institutes and possibly from a consultant, should review the ways in which other countries supply technical information to extension workers and train them in the use of information sources. It should then consider, in conjunction with BB which is interested in improving the supply of information to the agricultural extension service (BIMAS), what additional provision of information appears to be required and how best it can be organised.

38. This task would be well suited to the two officers of PDIN and BB who, if the submission to UNDP is approved, will visit European countries to study the management and planning of scientific information. They could easily study the supply of information to extension workers in the countries they visit.

5. FUNCTIONS OF NATIONAL CENTRES AND SPECIALISED UNITS

39. I have been asked to consider during my visit the respective functions of national centres and specialised units within the proposed network of information services and also the relations between them. Since my terms of reference relate to PDIN, I will devote most of my attention to its part of the network. But those whom I visited in the fields of biology and agriculture, medicine, and the social sciences and humanities hoped that I would also give some consideration to their problems and I have accordingly done so, though all too briefly.

a. Physical sciences and technology

40. Appendix 1 - a recommendation by Bryan (1972) - lists a fairly complete set of functions for a national centre in terms which leave ample scope for the development of specialised information services in the units. But he envisaged the national centre as having library as well as other functions, as supplementing the specialised collections of the units with a collection of its own. In agriculture history has not only given BB this function; it has made it easily the most important

library in the agricultural information network. PDIN, on the other hand, has developed primarily as a documentation centre and as a co-ordinator of other libraries. Its own collection is strong in Indonesian material, in abstracting and indexing journals and in literature for information specialists. But its collection of primary publications is small and wide-ranging. For example its primary periodicals, obtained mainly by donation and exchange, are drawn from a large assortment of subjects, and many are either of minor importance or would be better held in a specialised institute.

41. There is no need for PDIN to hold primary literature at all, except in the field of information studies. But the experience of BB suggests that there are distinct advantages in doing so. It enables a central library to hold all literature of general interest within its field of science and technology; and the specialised units to concentrate only on that literature which is of particular interest to their research workers and others in their narrow subject fields. It also gives additional status to the centre as a stimulating and co-ordinating body. In the physical sciences and technology the central collection, already including over 700 journals and about 2,700 books, is at the LIPI research centre in Bandung; nearly all of it has been recently unified in one library on the new campus. It covers physics, chemistry and much of engineering and LIPI hopes to build up its stock and services under the Second Five-Year Plan.

42. To an impartial outsider there is much to be gained by merging the LIPI research centre library with PDIN and removing PDIN to Bandung. In particular

a. The combined organisation would have resources and status to that of BB.

b. The central collection in the basic sciences and engineering could be built up to serve all research institutes, especially in Bandung, and those scientists and technologists who are doing advanced work at the Institute of Technology. This would include systematic coverage of all fields not covered by the specialised units outside LIPI and would greatly simplify the task of acquisition in these units.

c. PDIN's information work would be much eased. For example, its current awareness service, which is much more widely used since the Bandung workshop in 1971, would be facilitated by easy access to many of the journals required for photocopying.

d. PDIN staff would benefit from close proximity to scientists working at the heart of their subject field, would find it much easier to secure feedback

from users on the value of its services and would be in much better position to promote effective techniques of user training.

e. PDIN is particularly valued in the units for its stimulation and co-ordination of activity and for its work on professional education. In Bandung it would be close to a much higher proportion of the interested institutes than in Jakarta.

43. I recognise that plans are well advanced for housing PDIN in the new LIPI building in Jakarta. But, if these plans have not passed the point of no return, there is a strong case for reconsidering the advantages of removing PDIN to Bandung as soon as accommodation can be found or erected near to the LIPI campus.

44. A visitor to Indonesia cannot fail to be impressed by the readiness of the existing national centres and units to co-operate with each other and by the energy and skill of PDIN in promoting this co-operation. So long as this happy circumstance continues, the division of functions between PDIN and the specialised units should present no serious policy problems for the Information Council; the majority should be soluble at seminar level. The units will need to develop their functions with greater precision and to conform to the minimum standards which are gradually emerging from the PDIN seminars. But it is already clear that they should collect the primary, secondary and technical literature that is specifically in their subject fields, and should avoid duplication of effort, wherever possible, on the border-line with other subject fields; that they should provide their own documentation and other information services within their subject fields for research workers and for other users; and that, with help and co-ordination from PDIN, they should make their own arrangements for recruiting and training information specialists and for stimulating and training users.

45. PDIN can then safely base its activities on the list in Appendix I, though it would be wise not to rush at this early stage into time-consuming work on the preparation and maintenance of a union catalogue of books. It should add the functions proposed in this report, namely to

a. convene seminars of national centres and specialised units on operational problems and suitable policy issues (Recommendation 4)

b. work with the University of Indonesia library school on the possible extension of the master's course in librarianship into other aspects of information work (Recommendations 13-14).

c. Run (increasingly specialised) short courses for existing information specialists and also encourage local initiative (Recommendation 16)

d. Co-ordinate the growth of in-service training facilities in national centres and specialised units. (Recommendation 18)

e. Create a central team to help specialised units with user training. (Recommendation 20)

f. Review, and consider with BB, measures to improve the supply of information to industrial extension workers, when they come into being. (Recommendation 21)

46. In addition PDIN should have a small research and development function. Research should be confined to surveys of use and to fairly simple problems of managing libraries and information services. Priority should be given to research of general interest to the national centres and specialised units, and problems of purely local interest should be the concern of the other centres and units. PDIN need not recruit staff for this purpose, at least initially, if it can draw on expertise in the universities or in Government service.

47. Development should be concerned mainly with computing techniques. The rapid spread of computer-based information systems in the USA and Europe has caused a good deal of interest in Indonesia, though most people whth whom I discussed them realise that they are expensive unless they are heavily used and that at present use of them draws attention to large amounts of literature not held in Indonesia. In addition, there is possible scope for computing techniques in the handling of library records. The recent experiment with a computerised union catalogue of periodicals in Indonesian special libraries is a good example of what can be done effectively and at little cost, and I understand that other library projects are under discussion. In the near future a number of limited and inexpensive experiments could be made with computerised information services. For example, the major systems (eg Chemical Abstracts, INSPEC, MEDLARS) could be asked to run a few experimental services (selective dissemination or retrospective search) without charge so that Indonesian scientists could gain experience of using print-outs and feed back their reactions on the types of service that computers can give. The systems could also be asked to supply free a tape covering the input over one or more months, so that Indonesian computer specialists could gain experience of handling the data and also of problems of compatibility between computers and systems in this field. Again, it would be possible to subscribe for a limited period to a service such as the Institute of Scientific Information's ASCA, which covers mainly core journals and is therefore particularly suitable for experimental use in Indonesia.

48. I do not wish to recommend any particular experiments at this stage. The officers from PDIN and BB who visit European countries to study the management and planning of information will be able to examine the possibilities in detail and come back with specific suggestions. The important need is to launch a small amount of activity that will prompt constructive and reaslistic thinking about the possible scope for computerised services in Indonesia, acting alone or in conjunction with other countries of South-East Asia. It would not be wise for PDIN to recruit a computer specialist for this purpose because such specialists can only flourish and keep up to date in a lively computing environment. It should seek instead to work through one or more consultants in the universities or in Government service.

RECOMMENDATION 22. LIPI should give urgent consideration to the possibility of merging PDIN with the library of the LIPI research centre in Bandung in order to secure the important advantages set out in this report.

RECOMMENDATION 23. The division of functions between PDIN should continue to be worked out in seminars of information specialists in the spirit of co-operation which has marked these seminars so far. Major policy issues should be referred to the Information Council.

RECOMMENDATION 24. PDIN should untertake the functions listed in Appendix I and those proposed in Recommendations 4, 13-14, 16, 20 and 21. It should also undertake, mainly through consultancies,

a. surveys of use and research projects on simple management problems that are of general interest, limited and inexpensive

b. development work and experimental operation in the field of computerised information services and library records.

It should make adequate financial provision for these activities in its proposals for the Second Five-Year Plan.

b. Biology and Agriculture

49. Co-operation is already well established between BB and the specialised units in the Ministry of Agriculture and the LIPI research institutes at Bogor. The Library Committee mentioned in paragraph 33 meets regularly and ensures a measure of co-operation both on the acquisition of literature and on the allocation of it to individual libraries. It should prove very useful in dealing with the expansion of literature coverage that

that will be necessary under the Second Five-Year Plan. The Committee has not yet given much time to the broader problems of stimulating use and training users, but it is in a good position to do so, even though its members represent subject fields and not individual institutes.

50. In addition BB has followed up the Bandung workshop of 1971 by organising a seminar of agricultural information specialists in March 1972, which clearly defined the respective functions of BB and specialised units in the new "Network in Scientific Documentation and Information". It also proposed that those institutes that have no information units should set them up and that other institutes should take steps to improve the quality of their units so that they can play their part in the total network. These proposals seem to be very reasonable, given the present pattern of research institutes, and there would be much advantage in asking the proposed UNDP consultant (see paragraph 16) to study further the organisational needs of individual institutes when examining their needs for increased holdings of literature under the Second Five-Year Plan.

51. BB's plans are well in line with the functions of a national centre listed in Appendix I. In addition they include help to the Ministry's regional libraries, in-service courses, provision of training facilities, user surveys and a detailed proposal for mutual co-operation between BB and the university faculties of agriculture, biology and economics. In my discussions with the director it was clear that BB would be happy to make provision for services aimed specifically at agricultural extension workers; this would be a valuable addition to its services and would extend the use of the resources of agriculture literature.

RECOMMENDATION 25. The Ministry of Agriculture and LIPI should together review the need for creating information units in research institutes that do not already have them and for improving the quality of existing units; they should make appropriate financial provision in their submissions under the Second Five-Year Plan. The two organisations should at the same time consider whether Recommendation 19 of this report (on the stimulation and training of research workers) is best acted on by the existing Library Committee or by scientists nominated by individual institutes.

RECOMMENDATION 26. The Ministry of Agriculture should initiate discussions between BB and the agricultural extension service (BIMAS) to investigate how far BB can develop special information services for extension officers, how best these services can be organised and controlled and what provision should be made for them in the Second Five-Year Plan. The BB officer who is to

study the management and planning of agricultural information in European countries should examine the supply of information to extension services in these countries, and BB should subsequently co-operate with PDIN if it acts on Recommendation 21 above.

c. Medicine

52. Bryan (1972) proposed that the national centre for medicine should be the Department of Health, which at present does not have a substantial collection of its own but is much concerned with the supply of literature to medical and auxiliary practitioners through regional centres and other agencies. Following a consultant's report on medical libraries (Urata, 1971) the Ministry has also provided training for those in charge of libraries at regional centres and has offered financial incentives to encourage the writing of medical books and articles. The Ministry has expressed readiness to take responsibility for a national centre but is still at an early stage of thinking about the many policy problems that arise; for example, what should be the scope and functions of the national centre in relation to those of the regions; and how far should it concentrate on information for practitioners and how far on information for research workers, whose needs are at present met in a small way by PDIN. These issues are so large and complex that it would seem highly desirable for the Ministry to seek expert advice as soon as possible and not to try and meet the needs of all medical users at the outset but to identify priorities and meet them first.

RECOMMENDATION 27. The Ministry of Health should seek from UN or other sources the help of a specialist on medical information problems in drawing up a detailed plan, with priorities, for the initial development of a national centre and for its links with units elsewhere, including the regions and the universities. This assistance would be concerned with the creation of a central collection, the provision of services and the stimulation of use. The Ministry should also consider whether it is likely to recruit in Indonesia an able, trained and experienced officer to direct the centre, or whether it should seek extended aid to finance the employment of a consultant on building up the centre and training his successor.

RECOMMENDATION 28. PDIN should simplify the Ministry's task by continuing its present service to medical students and research workers for as long as is necessary.

d. Social Sciences and Humanities

53. Bryan (1972) proposed that the national centre for these subjects should be the library of the Museum. But this responsibility has not been formally accepted and I have not encountered much enthusiasm for it in my discussions. It was suggested in one interview that a distinction should be made between three types of material:

a. historical material, ie up to World War II, which is held by the Museum;

b. material of the last 30 years, which has been sporadically collected and is held in many places;

c. new material

This distinction offers a basis for an alternative approach to the problem.

54. Material in (a) is obviously best handled by the Museum though, as Bryan has strongly urged, there is an immediate need to preserve the existing collections of that library from material decay. Equally severe problems of preservation have faced the National Archive, but there they have been tacked vigorously with the necessary funds and administrative support. Material in (b) is best handled at present by a referral centre, identifying what is held locally, attempting to close important gaps, and providing access to the combined resources. Material in (c) needs to be collected and handled by the same combination of national centre and specialised units as is being developed in the physical and biological sciences and agriculture. These two tasks are best combined, for the present at least, in an organisation that is aware of the country's priorities for research in the social sciences and humanities and can therefore make effective use of limited resources. LIPI appears to be the most suitable body for this purpose, since it has two research institutes working on priority problems and has close contacts with the universities. But it would need help from a planning committee, representing different interested bodies, and possibly from a consultant - though it should be easier to find an Indonesian director in this subject field than in the natural sciences. The proposed study of the management and planning of social sciences and humanities information (on UNDP funds) is best undertaken not immediately but by the director designate, when recruited.

RECOMMENDATION 29 LIPI should accept, at least for the time being, responsibility for a national information centre for the social sciences and humanities, covering all new literature and literature published since World War II and placing emphasis on areas of research that

are particularly important for Indonesia. As part of this function it should assemble data on the holdings in Indonesian libraries of literature published since World War II and should offer a general referral service. The centre should be built up in close consultation with the universities and should be located in Jakarta, near to several universities, to the Museum and to the LIPI institutes which already have specialised units. It should have the assistance of a planning committee, representing the LIPI institutes, PDIN, the Museum, the National Archive and other ministerial interests. LIPI should be prepared to transfer the centre if a more suitable home appears in due course.

RECOMMENDATION 30. The Ministry of Education and Culture should take all necessary action to preserve the existing collection of the Museum library from material decay, so that it can play an effective part in the network. With support from LIPI it should emphasise the urgency of this task in seeking any necessary funds under the Second Five-Year Plan. The Museum should act as the national centre for all material issued before World War II and should consider with the LIPI research institutes, and the proposed LIPI centre how best to develop the use of this collection.

SUMMARY OF RECOMMENDATIONS

RECOMMENDATION 1. The Government should state in the Second Five-Year Plan its intention, as a matter of priority, to develop an effective network of scientific and technical information services as quickly as resources will allow; to back this intention with a significant increase in the funds available for acquiring literature, educating and training skills, and providing information services; and to ensure that these funds are well directed and spent by setting up interdepartmental machinery to determine and review the goals of the national network, to co-ordinate the functions of the various centres and units in the network, and to examine obstacles to effective development of services with a view to removing them wherever possible.

RECOMMENDATION 2. LIPI should invite suitably high-level representatives of interested ministries (research directors or above) to review in outline the plans of the respective national centres and specialised units for the development of scientific and technical information services under the Second Five-Year Plan; and to secure the best possible balance, harmony and cohesion between them before they are submitted to BAPPENAS. The meeting should represent the Ministries of Agriculture, Industry, Mining and Public Works and Electrical Power on behalf of their research institutes; the Ministry of Health in relation to the proposed national centre for medicine; the Ministry of Education and Culture in relation to libraries generally, university interests and the proposed national centre for social sciences information; and finally the National Institute of Public Administration.

RECOMMENDATION 3. The representative body should also prepare, for the approval of the respective ministries and institutes, proposals for a permanent Information Council charged with the administrative functions broadly described in Recommendation 1. The Council should be created as soon as possible and should undertake, among its first tasks, those proposed in Recommendations 7, 8, 9, 10 and 12 of this report or referred to it under Recommendations 4, 11 and 23. The Council should represent the same ministries and institutes, at a suitably high level, as are listed in Recommendation 3 and also, if possible, BAPPENAS. It should be regarded as the national focus for information policy in Indonesia and should report to the Government through LIPI, which should provide the Secretariat.

RECOMMENDATION 4. PDIN should continue to convene seminars of national centres and specialised units, as required, in order to discuss operational matters and to identify major policy issues for consideration by the Council proposed in Recommendation 3. It should provide for the cost of these seminars it runs, 1-2 a year, in its financial estimates under the Second Five-Year Plan.

RECOMMENDATION 5. The final version of the PDIN submission to UNESCO for support from UNDP funds should suggest that the two consultancies on material and manpower needs should concentrate on needs for scientific and technical literature of all kinds and should help the proposed local task force to identify more precisely the items to which it should give priority and to indicate the scale of growth in the total holdings that is necessary under the Second Five-Year Plan.

RECOMMENDATION 6. Seminars of information specialists, convened by PDIN and BB, should then ensure that each national centre and specialised unit works out detailed proposals for the acquisition of literature in 1974-79 and includes these proposals in its request for funds under the Second Five-Year Plan. The Seminar members should assume that the maximum benefit for Indonesian science and technology will be obtained if the growth of literature resources is most rapid in the first two years of the Plan, so that greatly increased resources are available for exploitation and use at an early date.

RECOMMENDATION 7. The proposed Information Council should seek to ensure that each member department and institute makes effective arrangements for the deposit of its reports and other unpublished literature. The receiving library can be in either one of the specialised units or in a national centre.

RECOMMENDATION 8. The Information Council should also consider at an early date the case for legislation requiring deposit of all Indonesian publications in national centres, and, if there are no serious obstacles, should press for early legislation.

RECOMMENDATION 9. The proposed Information Council should, as a matter of urgency, review the twin problems of low salaries and status of information specialists in Government service, explore possible ways of raising the salaries of all graduates to a level approaching that of research workers, and consider how best the process of raising the status of information specialists can be speeded up. It should pay particular attention to the need for information specialists to work in scientific, not administrative divisions and to receive regular allocations of funds so that they can plan ahead and develop managerial skill.

RECOMMENDATION 10. The Information Council should also promote the use of the term "information", wherever appropriate, in the titles of national centres and units that offer a range of information services, and also in official papers on the subject.

RECOMMENDATION 11. LIPI should convene in 1973 a second workshop of research directors and information specialists to consider how far the practice of nominating good and keen scientists to direct information units, after training, can be extended; to further the growing practice of grouping all information activities, including publications, in one unit; and to explore the possible scope for using scientists, part-time or whole time, temporarily or permanently, on information functions, both scientific and technical, which they can perform with little or no training. The workshop should make recommendations for research directors and heads of information units and should refer major policy issues, as necessary, to the proposed Information Council.

RECOMMENDATION 12. The proposed Information Council, with help from a seminar of information specialists from the national centres and units, should co-ordinate the individual approaches to external aid agencies for support of Indonesian graduates on postgraduate course abroad; and, if possible, should try to allocate priorities on the basis of need.

RECOMMENDATION 13. LIPI should invite the University of Indonesia (i) to set up a joint working party with PDIN to analyse the growing requirements of information specialists and to advise the director of the library school on the curriculum required; and (ii) to investigate the possibility of making the library school independent of the faculties but supported by all of them.

RECOMMENDATION 14. PDIN, in its final submission for UNDP funds, should seek to extend its three-month consultancy on the training of documentalists so as to provide for an initial visit of 4-6 weeks in which the consultant would help the joint working party to identify the requirements of information specialists and to determine the scope, aims and general structure of the extended course; and for a subsequent, much longer visit in which the consultant would help the director of the school to design, run and test the new sections of the course, with advice from the working party, and to train Indonesian staff to run the course after his return. If UNDP cannot support the subsequent visit, funds should be sought elsewhere.

RECOMMENDATION 15. LIPI should ask the Ministry of Education and Culture whether, when the proposed course for library assistants at Indonesian University is authorised, it could take steps to ensure even standards between the various courses for library assistants in Indonesian institutions and to establish a common qualification which can be obtained on any of the courses.

RECOMMENDATION 16. PDIN should resume its three-month courses for in-service education, making use of available accommodation and facilities in Jakarta, Bandung and possibly Bogor, and working in close co-operation with the heads of national centres and units. It should seek to introduce courses of a more specialised nature and, wherever possible, to encourage local initiative such as that recently shown by LPMB.

RECOMMENDATION 17. National centres and specialised units sending officers on postgraduate courses abroad should try to extend each visit by at least three months in order to include practical training in a lively information centre, whether or not this is a compulsory feature of the course. PDIN should be consulted about possible locations and possible ways of making the necessary arrangements.

RECOMMENDATION 18. Centres and units should offer to take as many trainees as possible as soon as they grow to the point where they can offer instructive experience for up to three months in a lively environment where a variety of information work is going on. PDIN, as well as offering these facilities itself, should co-ordinate the growth of facilities and the use of them by information specialists. In particular it should seek to spread the benefits of training evenly between the various centres and units.

RECOMMENDATION 19. LIPI should invite each director of a research institute to nominate a senior scientist, preferably one who shows interest in and aptitude for information exchange, to be responsible for stimulating interest among his colleagues in use of the literature and of information services, securing training of them in the use of locally available services and encouraging them to contribute from their experience to the improvement of services provided for them.

RECOMMENDATION 20. PDIN should take responsibility for creating a central team to help other centres and units run user-training courses involving both lectures and practical work. It should give priority, in seeking further support from external funds, to obtaining a consultant who can study the present pattern of use and non-use, design a course that is adaptable to local requirements, test it in a few locations and train PDIN staff to form a central team. The visit would need to last six months, preferably a year.

RECOMMENDATION 21. PDIN, with help from the units in industrial research institutes and possible from a consultant, should review the ways in which other countries supply technical information to extension workers and train them in the use of information sources. It should then consider, in conjunction with BB which is interested in improving the supply of information to the

agricultural extension service (BIMAS), what additional provision of information appears to be required and how best it can be organised.

RECOMMENDATION 22. LIPI should give urgent consideration to the possibility of merging PDIN with the library of the LIPI research centre in Bandung in order to secure the important advantages set out in this report.

RECOMMENDATION 23. The division of functions between PDIN should continue to be worked out in seminars of information specialists in the spirit of co-operation which has marked these seminars so far. Major policy issues should be referred to the Information Council.

RECOMMENDATION 24. PDIN should undertake the functions listed in Appendix I and those proposed in Recommendations 1, 13-14, 16, 20 and 21. It should also undertake, mainly through consultancies

a. surveys of use and research projects on simple management problems that are of general interest, limited and inexpensive

b. development work and experimental operation in the field of computerised information services and library records.

It should make adequate financial provision for these activities in its proposals for the Second Five-Year Plan.

RECOMMENDATION 25. The Ministry of Agriculture and LIPI should together review the need for creating information units in research institutes that do not already have them and for improving the quality of existing units; they should make appropriate financial provision in their submissions under the Second Five-Year Plan. The two organisations should at the same time consider whether Recommendation 19 of this report (on the stimulation and training of research workers) is best acted on by the existing Library Committee or by scientists nominated by individual institutes.

RECOMMENDATION 26. The Ministry of Agriculture should initiate discussions between BB and the agricultural extension service (BIMAS) to investigate how far BB can develop special information services for extension officers, how best these services can be organised and controlled and what provision should be made for them in the Second Five-Year Plan. The BB officer who is to study the management and planning of agricultural information in European countries should examine the supply of information to extension services in these countries, and BB should subsequently co-operate with PDIN if it acts on Recommendation 21 above.

RECOMMENDATION 27. The Ministry of Health should seek from UN or other sources the help of a specialist on medical information problems in drawing up a detailed plan, with priorities, for the initial development of a national centre and for its links with units elsewhere, including the regions and the universities. This assistance would be concerned with the creation of a central collection, the provision of services and the stimulation of use. The Ministry should also consider whether it is likely to recruit in Indonesia an able, trained and experienced officer to direct the centre, or whether it should seek extended aid to finance the employment of a consultant on building up the centre and training his successor.

RECOMMENDATION 28. PDIN should simplify the Ministry's task by continuing its present service to medical students and research workers for as long as is necessary.

RECOMMENDATION 29. LIPI should accept, at least for the time being, responsibility for a national information centre for the social sciences and humanities, covering all new literature published since World War II and placing emphasis on areas of research that are particularly important for Indonesia. As part of this function it should assemble data on the holdings in Indonesian libraries of literature published since World War II and should offer a general referral service. The centre should be built up in close consultation with the universities and should be located in Jakarta, near to several universities, to the Museum and to the LIPI institutes which already have specialised units. It should have the assistance of a planning committee, representing the LIPI institutes, PDIN, the Museum, the National Archive and other ministerial interests. LIPI should be prepared to transfer the centre if a more suitable home appears in due course.

RECOMMENDATION 30. The Ministry of Education and Culture should take all necessary action to preserve the existing collection of the Museum library from material decay, so that it can play an effective part in the network. With support from LIPI it should emphasise the urgency of this task in seeking any necessary funds under the Second Five-Year Plan. The Museum should act as the national centre for all material issued before World War II and should consider with the LIPI centre how best to develop the use of this collection.

APPENDIX I PROPOSED FUNCTIONS FOR NATIONAL CENTRES

Recommendation 19 of Bryan, 1972

The function of each centre of the National Library and Documentation Service should be:

1. To provide library and documentation services for the Government and people of Indonesia both from its own resources and, in cooperation with the other centres of the National Library and Documentation Service, by coordinating, channelling and supplementing, where appropriate, the services provided by other libraries and documentation agencies in Indonesia, and to this end:

2. In the area of collection building -

   a. to complete and maintain the national record by acquiring currently and retrospectively, and preserving, materials, published and unpublished, written in Indonesia, by Indonesians or about Indonesia, in the appropriate subject area,

   b. to acquire other books, periodicals and other materials in the general area of its subject interest, particularly in supplementation of such specialist collections as are identified from time to time in other libraries and documtation agencies in Indonesia,

   c. to acquire or subscribe to especially expensive items, collections or information services, even if they fall within one of the areas of specialization referred to in 2b above, which are required by the nation but which either should not be duplicated unnecessarily or are beyond the means of the appropriate specialist library,

   d. especially in relation to 2b above, to initiate and encourage wherever possible, the rationalization of the acquisition of material by the several libraries and documentation agencies of Indonesia, in the interests of the minimum of unnecessary duplication and the most effective use of the totality of available funds,

3. In the area of bibliographical services -

   a. to initiate, maintain and, if feasible, publish in some form, appropriate union catalogues of material held in libraries and documentation agencies in Indonesia in its subject field,

b. to cooperate with other centres of the National Library and Documentation Service in preparing and publishing the national bibliography, both current and retrospective, of works published in Indonesia, by Indonesians, or about Indonesia,

c. to cooperate with other centres of the National Library and Documentation Service, and with other libraries and documentation agencies in Indonesia, in undertaking and making available documentation services such as the indexing and abstracting of periodicals and other material, in areas where existing indexing and abstracting services are unsatisfactory for Indonesian purposes,

4. In the area of reader services -

a. to assist libraries and other agencies and individual enquirers to use the resources of its own collections,

b. to seek material in other libraries and documentation agencies in Indonesia or overseas in the interests of individual enquirers, and to channel requests submitted by libraries and other agencies for such material,

c. to publicize the availability of information by such means as current awareness services, including selective dissemination of information, and the publication of regular or irregular accession lists, bibliographies, or other informative material,

5. In the area of technical advice and assistance -

to provide advice and assistance, including, where necessary and where feasible, the actual short-term secondment of staff, to libraries and documentation agencies in Indonesia, in such areas as librarianship, bibliography and technical editing.

6. To maintain liaison with appropriate international and regional agencies.

7. To carry out such other functions as shall from time to time be assigned to it by a proper authority.

APPENDIX II PROPOSED FUNCTIONS FOR SPECIALISED UNITS

Extract from

"Resolutions of the Seminar on the co-ordination of collections and acquisitions of special libraries in the field of science and technology", June, 1972

II Co-operation between the library units in Section A*

It was agreed:

i. that each library unit in Section A be responsible, together with the Centre of Section A (P.D.I.N.), for acquiring, maintaining and disseminating scientific information in the field entrusted to it, and, among other things, issue on a regular basis (at least twice yearly) a bibliography of new acquisitions in its field of specialisation. This will be sent to P.D.I.N. and to the other units in the section.

ii. that each library unit send a list of its fields of specialisation to P.D.I.N.

iii. that P.D.I.N. evaluate these lists and issue a guide to the fields of science and technology covered by section A.

iv. that P.D.I.N. evaluate the libraries listed in Ii.

v. that P.D.I.N. prepare a manual of requirements to help libraries to be set up as information centres geared to function in the network of section A.

vi. that the Seminar request P.D.I.N. to co-ordinate study groups on various topics which can facilitate co-operation between the library units, eg standardization, etc.

*Physical sciences and technology

APPENDIX III REFERENCES

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